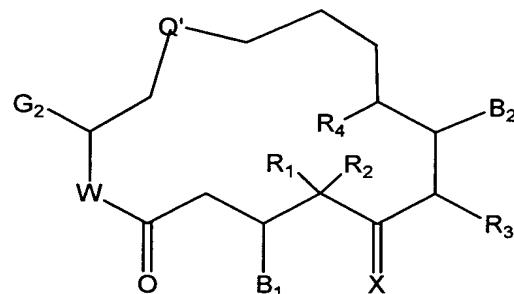


Claims

What is claimed is:

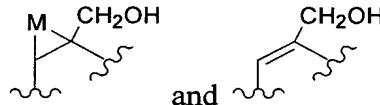
1. A method for the preparation of at least one 26-hydroxyepothilone of formula:



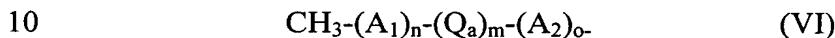
5

where:

Q' is selected from the group consisting of



G_2 is the following formula (VI)



A_1 and A_2 are independently selected from the group of optionally-substituted ($\text{C}_1\text{-C}_3$)alkylene and ($\text{C}_2\text{-C}_3$)alkenylene;

Q_a is an optionally-substituted ring system containing one to three rings and at least one carbon to carbon double bond in at least one ring;

15 $n, m,$ and o are integers independently selected from the group consisting of zero and 1, where at least one of m or n or o is 1;

W is O or $\text{NR}_6;$

X is selected from the group consisting of $\text{O},$ and $\text{H}, \text{OR}_7;$

M is $\text{O}, \text{S}, \text{NR}_8,$ or $\text{CR}_9\text{R}_{10};$

20 B_1 and B_2 are selected from the group consisting of $-\text{OR}_{11}$ and $-\text{OC}(=\text{O})\text{R}_{12};$

$\text{R}_1\text{-R}_4$ and $\text{R}_{12}\text{-R}_{17}$ are selected from the group consisting of $\text{H},$ alkyl, substituted alkyl, aryl, and heterocyclo, except R_{15} is not hydrogen, and when R_1 and R_2 are alkyl, they can be joined to form a cycloalkyl;

R_6 is selected from the group consisting of $\text{H},$ alkyl, and substituted alkyl;

R_7 and R_{11} are selected from the group consisting of H, alkyl, substituted alkyl, trialkylsilyl, alkyldiarylsilyl, and dialkylarylsilyl;

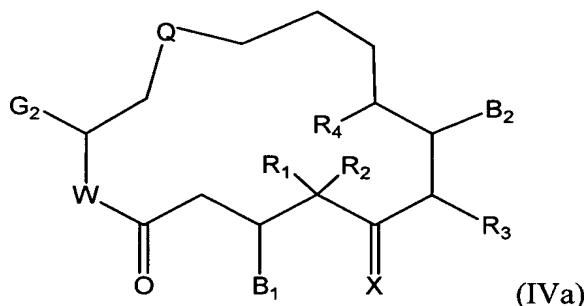
R_8 is selected from the group consisting of H, alkyl, substituted alkyl, $R_{13}C(=O)-$, $R_{14}OC(=O)-$, and $R_{15}S(O)_2-$; and

5 R_9 and R_{10} are selected from the group consisting of H, halogen, alkyl, substituted alkyl, aryl, heterocyclo, hydroxy, $R_{16}C(=O)-$, and $R_{17}OC(=O)-$;

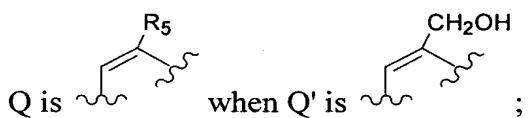
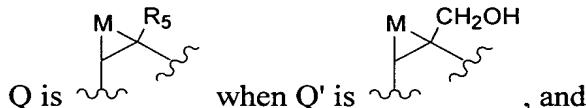
the pharmaceutically-acceptable salts thereof and any hydrates, solvates, or geometric, optical and stereoisomers thereof;

comprising the steps of:

- 10 a) contacting at least one epothilone of formula IVa



where:



- 15 R_5 is $-CH_3$; and

W , X , G_2 , M , B_1 , B_2 , R_1-R_4 , and R_6-R_{17} are defined above;

the pharmaceutically-acceptable salts thereof and any hydrates, solvates, or geometric, optical and stereoisomers thereof;

with a microorganism or enzyme derived therefrom capable of selectively catalyzing

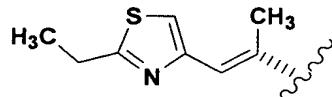
- 20 the hydroxylation of said R_5 group to $-CH_2OH$; and

b) effecting said hydroxylation.

2. The method of claim 1 wherein n is zero and m is 1.

3. The method of claim 1 wherein n is zero, m is 1, and A₂ is alkenyl.

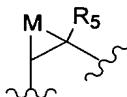
4. The method of claim 1 wherein G₂ is



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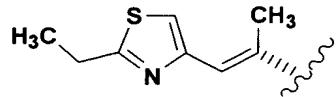
5. The method of claim 1 wherein said microorganism is *Amycolata autotrophica* ATCC 35203.

6. The method of claim 1 wherein Q is



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7. The method of claim 6 wherein G₂ is

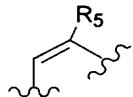


15 8. The method of claim 7 wherein said epothilone of formula IVa is epothilone B and said 26-hydroxyepothilone is 26-hydroxyepothilone B.

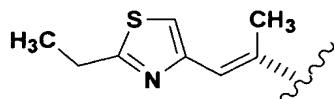
9. The method of claim 8 wherein said microorganism is *Amycolata autotrophica* ATCC 35203.

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10. The method of claim 9 wherein said Q is



11. The method of claim 10 wherein G₂ is



12. The method of claim 11 wherein said epothilone of formula IVa is epothilone D and said 26-hydroxyepothilone is 26-hydroxyepothilone D.

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13. The method of claim 12 wherein said microorganism is *Amycolata autotrophica* ATCC 35203.

14. A method for the preparation of a mixture of epothilone F and 26-hydroxyepothilone B
10 comprising the steps of:
a) contacting epothilone B with a microorganism or enzyme derived therefrom capable of catalyzing the hydroxylation of said epothilone B to epothilone F and 26-hydroxyepothilone B; and
15 b) effecting said hydroxylation.

15. The method of claim 14 wherein said microorganism is *Amycolata autotrophica* ATCC 35203.

20 16. An isolated microorganism, or a mutant or variant thereof, having ATCC accession number PTA-1043.

17. A biologically pure culture of a microorganism, or a mutant or variant thereof, having ATCC accession number PTA-1043.